

What is claimed is:

- 1 1. A connector apparatus for securing a printed circuit board to supporting apparatus
2 comprising
3 a body member with upper and lower surfaces;
4 an internally threaded opening extending into said body member from said upper surface;
5 and
6 a plurality of rigid, parallel, cantilevered pins extending from said body member lower
7 surface and disposed radially outward with respect to said threaded opening.
- 1 2. The connector apparatus of claim 1 wherein said body member is formed of a molded
2 polymer wherein said threaded opening is formed in a metal insert which presents such internal
3 threaded opening at said upper surface and said plurality of pins comprise at least three pins
4 captured by said molded polymer and extending from said lower surface.
- 1 3. The connector apparatus of claim 2 wherein said metal insert is an internally threaded
2 cylindrical member and said pins are disposed radially outward with respect to said cylindrical
3 member.
- 1 4. The connector apparatus of claim 2 further comprising means carried by said connector
2 for engagement with a board on which said connector is mounted to establish alignment of said
3 connector on said board.
- 1 5. The connector apparatus of claim 4 wherein said means carried by said connector
2 comprises an axial projection formed as part of said body member, extending parallel to said
3 pins, wherein said axial projection engages a depression in said board to effect the alignment.

1 6. The connector apparatus of claim 2 further comprising means carried by said connector
2 for engagement with a board on which said connector is mounted to establish the distance
3 separating the connector body portion from said board in the installed condition.

1 7. The connector apparatus of claim 6 wherein said means carried by said connector
2 comprises an axial projection formed as part of said body member, extending parallel to said
3 pins, and having a length equivalent to the separation to be established between said connector
4 body member and a board on which said connector apparatus is mounted.

1 8. The connector apparatus of claim 2 wherein said body member molded polymer is an
2 electrically insulating material which electrically insulates said pins from said metal insert which
3 presents a threaded opening.

1 9. The connector apparatus of claim 2 wherein said body member molded polymer is an
2 electrically conducting material which provides an electrically conductive path between said pins
3 and said threaded metal insert.

1 10. The connector apparatus of claim 1 wherein said body member includes a pair of parallel
2 side surface portions whereby said body member can be grasped by a tool to enable manual or
3 automated fabrication of said connector apparatus.

1 11. A circuit board including connector structure for attachment to supporting apparatus
2 comprising
3 a circuit board;
4 a connector body portion with an upper surface facing away from said circuit board and a
5 lower surface which confronts said circuit board;
6 a central threaded opening extending into said connector body upper surface;
7 a plurality of rigid, parallel, cantilevered pins secured to said connector body portion and
8 extending to said circuit board;

9 a like plurality of openings in said circuit board which are aligned with and into which
10 said pin cantilevered ends respectively extend; and

11 means securing said pin cantilevered ends respectively in said plurality of circuit board
12 openings.

1 12. The circuit board connector structure of claim 11 wherein said like plurality of openings
2 in said circuit board are parallel vias extending through said circuit board and said means
3 securing said pin cantilevered ends comprises soldering said pins within said vias.

1 13. The circuit board connector structure of claim 12 wherein said body portion is formed of
2 a polymer material in which is captured a metal insert with said central threaded opening being
3 an internal threaded surface within said insert that extends from said upper surface and said pins
4 have end portions encapsulated and retained by said polymer and are disposed radially outward
5 with respect to said metal insert and said body portion further includes a pair of parallel side
6 surface portions, whereby said body portion can be gripped by a tool to enable manual or
7 automated fabrication of said connector structure or assembly of said connector structure to said
8 circuit board.

1 14. The circuit board connector structure of claim 13 wherein said metal insert is an
2 internally threaded sleeve extending axially into said polymer body portion from said upper
3 surface.

1 15. The circuit board connector structure of claim 14 wherein when the connector structure is
2 assembled to said circuit board with said cantilevered pins secured within said circuit board vias,
3 said body portion is secured to, but spaced from said circuit board.

1 16. The circuit board connector structure of claim 15 further comprising means for limiting
2 penetration of said connector pin cantilevered ends into said circuit board openings.

- 1 17. A connector apparatus for securing a printed circuit board to supporting apparatus
2 comprising
3 a body member with upper and lower surfaces;
4 an internally threaded surface extending into said body member from said upper surface
5 thereof;
6 a plurality of rigid, parallel, cantilevered pins secured to said body member and extending
7 perpendicular to said lower surface in the direction opposite the direction to which said internally
8 threaded surface opens.
- 1 18. The connector apparatus of claim 17 wherein said body member is formed of a molded
2 polymer and further comprising a metal insert captured by said body member molded polymer
3 with said internally threaded surface formed as an internal threaded surface within said metal
4 insert.
- 1 19. The connector apparatus of claim 18 wherein said metal insert includes an irregular outer
2 surface which engages said body member polymer to resist extraction of said metal insert from
3 said molded polymer body member and rotation of said metal insert with respect to said molded
4 polymer body member.
- 1 20. The connector apparatus of claim 19 wherein said cantilevered pins are formed of metal
2 with an end portion captured within said molded polymer body member.
- 1 21. The connector apparatus of claim 20 wherein said cantilevered pins include irregular
2 surfaces within said molded polymer body member and are positioned radially outward with
3 respect to said metal insert.
- 1 22. The connector apparatus of claim 17 wherein said body member includes a pair of
2 parallel side surface portions, whereby said body member can be gripped by a tool to enable
3 manual or automated fabrication of said connector apparatus.